1. A method for producing ethanol and methane from biomass, comprising:

a) enzymatically liquefying and saccharifying flour of a biomass with a particle size of less than 1 mm in a conventional manner in the presence of water, thereby obtaining a mash;

b) fermenting and distilling the substrate in a conventional manner, thereby obtaining ethanol and a pulp;

c) separating the pulp into a solid phase and a clear phase, wherein a clear phase with a content of solids of less than 1% is obtained; and

d) obtaining methane from the clear phase in a methane reactor.

2. The method according to claim 1, comprising milling biomass to a particle size of less than 1 mm, thereby producing flour.

3. The method according to claim 1, wherein hull components are substantially separated from the flour prior to step a, or separated from the mash prior to step b.

4. The method according to claim 1, wherein the biomass is grain.

5. The method according to claim 1, wherein grain, in particular wheat, rye, maize or triticales is used as biomass, and the bran is separated after milling.

6. The method according to claim 1, wherein the particle size of the flour is less than 0.6 mm.

7. The method according to claim 1, wherein proteins present in the biomass are substantially separated from the flour prior to step a or separated from the mash prior to step b or separated from the clear phase of the pulp in step c.

8. The method according to claim 7, wherein the separation of the proteins prior to step b comprises precipitation by cooling and separation of the precipitate.

9. The method according to claim 7, wherein the separation of the proteins in step c comprises precipitation by cooling and separation of the precipitate.

10. The method according to claim 9, wherein yeast, fibers, solid substances, fat and/or proteins present in the pulp are agglomerated by cooling and sedimented prior to separation of the pulp into solid phase and clear phase.

11. A method for producing ethanol and methane from grain, comprising

a) milling the grain to a particle size of less than 1 mm and separating the bran from the flour;

b) enzymatically liquefying and saccharifying the flour in a conventional manner in the presence of water, thereby obtaining a mash;

c) substantially precipitating the proteins present in the mash by cooling, sieving and drying, thereby obtaining the proteins and a substrate;

d) fermenting and distilling the substrate in a conventional manner, thereby obtaining ethanol and pulp;

e) separating the pulp into a solid phase and a clear phase, wherein a clear phase with a content of solids of less than 1% is obtained; and

f) obtaining methane from the clear phase in a high-performance methane reactor.

12. The method according to claim 11, wherein a decanter or a disk centrifuge is used for separation of the solid phase and clear phase of the pulp.

13. The method according to claim 11, wherein about 80% of the liquid in the pulp is withdrawn with the clear phase.

14. The method according to claim 11, wherein the content of solids in the clear phase is less than 0.5%.

15. The method according to claim 11, wherein said fermenting is carried out in a

batch process, in a cascading process, or in a continuous process comprising a recycling of yeast.

16. A method for producing ethanol and methane from grain, comprising

a) milling the grain to a particle size of less than 1 mm, preferably less than 0,6 mm, and separating bran and hull components from the flour;

b) enzymatically liquefying and saccharifying the flour in a conventional manner in the presence of water, thereby obtaining a mash;

c) fermenting and distilling the substrate in a conventional manner, thereby obtaining ethanol and pulp;

d) agglomerating yeast, fibers, solid substances, fat and/or proteins present in the pulp by cooling and sedimenting them;

e) dividing the pulp into a solid phase and a clear phase, wherein a clear phase with a content of solids of less than 1% is obtained; and

f) obtaining methane from the clear phase in a high-performance methane reactor.

17. The method according to claim 16, wherein a high-performance methane reactor is employed, comprising beads with a diameter of 1 to 2 mm in which methane bacteria are immobilised.

18. The method according to claim 17, wherein the immobilisation of the methane bacteria in the beads increases the space-time yield in the reactor and preferably allows a space-time yield of at least 25 kg CSB/(m^3*d).

19. The method according to claim 16, wherein the methane production in a high-performance methane reactor comprises a pre-acidification/conditioning.

20. The method according to claim 16, wherein the high-performance methane reactor comprises an Upflow anaerobic sludge blanket (UASB)-reactor.

21. The method according to claim 16, wherein the high-performance methane reactor comprises an Internal Circulation (IC)-reactor.

22. The method according to claim 11, wherein the crude ethanol is rectified and, if necessary, dehydrated, in order to obtain bioethanol or neutral ethanol.

23. The method according to claim 1, wherein more than 100 m^3 ethanol/day are produced.

24. The method according to claim 1, wherein more than 300 m^3 ethanol/day are produced.

25. The method according to claim 1, wherein the clear phase of the pulp is aerobically purified after anaerobic purification in the methane reactor.

26. The method according to claim 25, wherein the anaerobically/aerobically purified clear phase is added to the conversion process as water for dilution.

27. The method according to claim 25, wherein the anaerobically/aerobically purified clear phase is employed for the addition of water for liquefaction of the flour.

28. The method according to claim 27, wherein the solid phase of the pulp is mixed with separated hull components and/or bran.

29. The method according to claim 11, wherein the solid phase of the pulp is mixed with separated proteins.

30. The method according to claim 28, wherein the mixture is further dried.

31. The method for producing a feeding stuff and/or fertilizer comprising a method

according to claim 28.

32. A method for producing energy and/or heat, comprising the method for producing ethanol and methane according to claim 1, wherein said methane is converted to energy and/or heat.

33. The method according to claim 32, wherein the solid phase of the pulp is dried and burned for the generation of energy.

34. The method for producing energy and/or heat, comprising a method for producing ethanol and methane from grain, comprising

a) milling the grain to a particle size of less than 0.6 mm and separating bran and hull components from the flour;

b) enzymatically liquefying and saccharifying the flour in a conventional manner in the presence of water, thereby obtaining a mash;

c) fermenting and distilling the substrate in a conventional manner thereby obtaining ethanol and pulp;

d) agglomerating yeast, fibers, solid substances, fat and/or proteins by cooling and sedimenting them;

e) dividing the pulp into a solid phase and a clear phase, wherein a clear phase with a content of solids of less than 1% is obtained; and

f) obtaining methane from the clear phase in a high-performance methane reactor and drying and burning the solid phase of the pulp for the generation of energy.

35. A method of using the clear phase of pulp from the production of bioethanol with a content of solids of less than 1% (w/v) for producing methane, energy, and heat, wherein a high-performance methane reactor is employed for production of methane, comprising beads with a diameter of 1 to 2 mm in which methane bacteria are immobilised.

36. The method according to claim 35, wherein the immobilisation of the methane

bacteria in the beads increases the space-time yield in the reactor and preferably allows a space-time yield of at least 25 kg CSB/(m^3*d).

37. The method according to claim 35, wherein the method of preparing methane in a high-performance methane reactor comprises a pre-acidification/conditioning.

38. The method according to claim 35, wherein the high-performance methane reactor comprises an Upflow anaerobic sludge blanket (UASB) reactor.

39. The method according to claim 35, wherein the high-performance methane reactor comprises an International Circulation (IC) reactor.

40. A production plant for producing ethanol and methane from a biomass in accordance with claim 1 further comprising a means for fermentation, distillation, and a high-performance methane reactor.